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### Kurzfassung des Forschungsprojektes

#### Radiological, Chemical, and Pharmacological Cholinergic System Parameters and Neurocognitive Disorders in Older Presurgical Adults

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**Background:** A pre-existing neurocognitive disorder (NCD) is a relevant factor for the outcome of surgical patients. To improve understanding of these conditions, we investigated the association between parameters of the cholinergic system and NCD.

**Methods:** This investigation is part of the BioCog project ([www.biocog.eu](http://www.biocog.eu)), which is a prospective multicenter observational study including patients aged  $\geq 65$  years scheduled for elective surgery. Patients with a Mini-Mental-State-Examination (MMSE) score  $\leq 23$  points were excluded. NCD was assessed according to the 5th Diagnostic and Statistical Manual of Mental Disorders criteria. The basal forebrain cholinergic system volume (BFCSV) was assessed with Magnetic Resonance Imaging, the peripheral cholinesterase (ChE) activities with point-of-care measurements, and anticholinergic load by analyzing the long-term medication with anticholinergic scales (ADS, ARS, ACBS). The associations of BFCSV, ChE activities, and anticholinergic scales with NCD were studied with logistic regression analysis, adjusting for confounding factors.

**Results:** A total of 797 participants (mean age 72 years, 42 % females) were included. 111 patients (13.9 %) fulfilled criteria for mild NCD and 82 patients (10.3 %) major NCD criteria. We found that AcetylChE activity was associated with major NCD (Odds Ratio (95 %-Confidence Interval); [U/gHB] 1.061 (1.101;1.115)), as well as ADS score ([Points] 1.353 (1.063;1.723)) or ARS score respectively ([Points] 1.623 (1.100;2.397)) with major NCD. However, we found no association between BFCSV or ButyrylChE activity with mild or major NCD.

**Conclusions:** AcetylChE activity and anticholinergic load were associated with major NCD. Future research should focus on the association of the cholinergic system and the development of postoperative delirium and postoperative NCD.

### Curriculum Vitae

Geburtsdatum und -ort:	Juni 1990 in Neubrandenburg
Studium:	2008–2015 Studium der Humanmedizin Universitätsmedizin Greifswald 2011–2016 Bachelor of Biomedical Science Universitätsmedizin Greifswald
Promotion:	Identifikation und Charakterisierung von Polymorphismen im Bereich des 5'UTR des Small heterodimer Partner 1 (SHP1), 2016
Tätigkeit:	Ärztin in Weiterbildung, wissenschaftliche Mitarbeiterin
Preise:	2011–2012 Stipendium im Rahmen des Gerhard-Domagk- Nachwuchsförderungsprogramms der Universitätsmedizin Greifswald 2014–2015 Deutschland-Stipendium der Ernst -Moritz-Arndt Universität Greifswald 2018–2019 Förderung im Rahmen des Junior Clinician Scientist Program des Berliner Instituts für Gesundheitsforschung (BIH) seit 04/2018 Förderung im Rahmen des Mentorenprogrammes des Wissenschaftlichen Arbeitskreises Wissenschaftlicher Nachwuchs der DGAI 04/2018 1. Preis im wissenschaftlichen Vortragswettbewerb auf dem Deutschen Anästhesiekongress (DAC) seit 07/2019 Förderung im Rahmen des Digital Clinician Scientist Program des Berliner Instituts für Gesundheitsforschung (BIH) 06/2021 1. Preis im wissenschaftlichen Vortragswettbewerb auf der Konferenz der German Society of Anti-Aging Medicine e.V. (GSAAM) 2022 Lydia Rabinowitsch-Förderung der Charité – Universitätsmedizin Berlin 2022 BIH Gender Equality Fund